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ABSTRACT

This annotated bibliography is intended to provide community college and technical institute personnel with a listing of available curriculum guides dealing with automated technologies. Described in the handbook are a total of 31 curriculum guides that were selected because they met the following criteria: availability in the ERIC system or curriculum center, design for use by community colleges or technical institutes, availability from a noncommercial or nonprofit curriculum center, and generalizability and national scope. Guides addressing the following subject areas are included in the handbook: computers and microcomputers, drafting and design technology, electronics, generic science and engineering skills, hydraulics, instrumentation, laser technology, mathematics, and robotics. Each annotation contains author, title, and publisher information; an ERIC document number, when available; and a product abstract. (MN)

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ED260276

Automated Technologies Noncommercial/Nonprofit Curriculum Guides and Resources Available for Community Colleges and Technical Institutes

by

Charles R. Doty*

The purpose of this report is to provide community college and technical institute personnel those curriculum guides which are available concerning automated technologies. The guides have been selected based upon the following criteria:

The guides are available in the ERIC system or curriculum center.

The curricula are designed for community colleges and technical institutes.

The curricula are noncommercial and/or available from nonprofit curriculum centers.

The curricula have a generalizability that is national in scope.

To present the information conveniently, an alphabetical listing of different curricula areas is given with a list of references for each area. This listing is followed by abstracts of the references in alphabetical order.

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Curricula Listing

Computer/Microcomputer

American Institutes for Research
Colbrese
Department of the Army
Harris
V-TECS
Jennings
Lewis
Tree
United States Air Force

Drafting/Design Technology

Fitzpatrick, et al.

Electronics

Baker
Baldwin
Butler
Darlow
Electronics/Electrical Curriculum Cluster
Electronics Technician... Competency Test
Sappe, et al.

Generic Science and Engineering Skills

Mowery and Wolf

Hydraulics

Decker

Instrumentation

Lewis and Moth
Military Curriculum Materials
Mixon
Sappe, et al. Instrumentation Technology

Laser Technology

Wasserman

Mathematics

Edwards and Roberson
Flannery

Robotics

Lynch
Parsons and Kearsley
Parsons
The Impacts of Robotics

American Institute for Research in the Behavioral Sciences. Computer Operator: Vocational Competency Measures. Pala Alto, Ca.: AIR, 1982.

The competency measures material includes a job information test, work habits inventory, examiner's manual, and tests. The copyrighted material is available for loan from:

Western Curriculum Coordination Center
1776 University Avenue, Wist Hall 216
Honolulu, Hawaii 96822
(808) 948-6496

or contact

American Institute for Research
P.O. Box 1113
1791 Arastradero Road
Palo Alto, CA 94302

Baker, J. S. A Comparative Curriculum Analysis of an Associate Degree Program at a Corporate School, a State College, and a Community College. Arizona; Mesa Community College, 1983. (ED 232748)

A comparative curriculum analysis was performed of the associate degree, electronics engineering technology programs of the DeVry Institute of Technology (DIT), a corporation-owned proprietary school in Illinois, Lake Superior State College (LSSC) in Michigan, and Mesa Community College (MCC) in Arizona. The curricula were compared in terms of curriculum characteristics (i.e., entrance requirements, accreditation, length of program, instructional methods, scholastic standards, and tuition costs); general education requirements; and requirements in technical courses. The study revealed that: (1) entrance requirements were similar at all three institutions, with MCC having the least restrictive requirements; (2) all three institutions were accredited by their regional association; (3) the progaram at DIT was almost twice as long as the other two; (4) all three programs employed the traditional lecture method with some laboratory work; (5) tuition costs were lowest at the MCC; (6) DIT required proportionally more units of technical and electronics courses and placed a greater emphasis on mathematics than the other colleges; and (7) general education requirements were similar at all three schools. Study conclusions emphasize the unexpected breadth in the curriculum of the corporation-sponsored school.

Baldwin, R. D. Training the Electronics Maintenance Technician. Alexandria, VA: Human Resources Research Organization, 1978. (ED 156889)

For more than twenty years controversy has existed in the Armed Forces over the kind of knowledge and training electronic maintenance technicians should have. The Navy and Air Force have conducted research projects in this area, and for the Army the Human Resources Research Organization (HumRRO) has developed several methods to improve the training of Signal Corps electronic maintenance personnel. Emphasizing a functional contest approach rather than the theory and design of systems, HumRRO considered two elements to be essential to equip the student with capabilities general enough to enable him to cope with the numerous different problems he would encounter: first, the learning context must have meaning for the student based on his previous learning, and second, it must have relevance to the instructional goals. Throughout the 1950's and 1960's, HumRRO conducted numerous field studies of which the most important task projects were FORCAST, JOBTRAIN, MAINTRAIN, REPAIR, LIMIT, and a summation-type project called HAWKEYE. The results from this research into the training of electronics maintenance technicians can be generalized to the problems faced by all trainers, and HumRRO has developed a systematic and general procedure for curricular control that can be used in all job training courses.

Butler, R. H., et al. Electromechanical Technology Post Secondary Curriculum Guide. Athens, Georgia: Georgia State Department of Adult and Vocational Education, 1981. (ED 216118)

This curriculum guide provides a model for a postsecondary electromechanical technology program. It is divided into 10 sections. Section 1 overviews the philosophy, purpose, and goals for vocational education in Georgia. Contents of section 2 include a definition of the guide's purpose and program objective. Section 3 describes the occupational field, discusses employability skills, and provides information on exit points and task listing by Dictionary of Occupational Titles code. Examples of a curriculum structure and course outline are provided in section 4. Section 5 contains the unit guides for 19 units and 185 tasks. Each task contains the following information: task, performance objective, instructional activities, suggested instructional materials, evaluation, and classroom hours. Topics covered include reading blueprints, schematics, and symbols; identifying metal and non-metal materials; plant safety; handtools; elements of mechanics; lubricants and lubrication; drive systems; bearings; pumps; piping systems; hydraulic systems; pneumatic systems; packaging methods; packing machinery; and casing machinery. Section 6 includes an instructional resource matrix, list of textbooks, suppliers of materials, and additional instructional resources. Forms for recording student progress are provided in section 7. Section 8 addresses working with special needs students. Section 9 and 10 contain facility layouts and definitions of terms.

Butler, R. H. Electrical Technology. Postsecondary Curriculum Guide. Atlanta, Georgia: Georgia State Department of Adult and Vocational Education, 1981. (ED 216117)

This curriculum guide provides a model for organizing vocational instructional content for a postsecondary electrical technology program. It is divided into six sections. Section 1 overviews the philosophies, purposes, and goals for vocational education in Georgia. Contents of section 2 include a discussion of employability skills, description of the occupational field, program objective containing specific occupational titles, description of occupational exit points, and task listing by Dictionary of Occupational Titles code. Section 3 contains the unit guides for the 10 duties and 99 tasks included in the course. Each task is presented on a separate page and contains the following information: task, performance objective, instructional activities, suggested instructional materials, evaluation, and class and lab hours. Topics covered include introduction to electricity/electronics, electrochemical action and direct current (DC), alternating current (AC), measuring instruments, protective devices, DC equipment and controls, singlephase motors, polyphase systems, AC control equipment, and electrical troubleshooting. Section 4 provides suggested methods of structuring the curriculum. Suggested ways of recording and documenting student progress are presented in section 5. Section 6 contains facility layouts. Appendixes include instructional resource matrix, unit guide references, additional instructional resources, information on working with special needs students, and definitions of terms.

Colbrese, N. P. Microcomputers and Electronics Task Analysis: Model for Private Sector Involvement with Public Education. Illinois: Chicago Association of Commerce and Industry, Private Industry Council and Work-Education Council of the South Suburbs.

This publication* is for sale from:

Work-Education Council of the South Suburbs
15800 South State Street
South Holland, IL 60473
(312) 339-8886

Also on loan from:

East Central Network
Illinois Vocational Curriculum Center
Campus of Sangamon State University
Office E-22
Springfield, IL 62708
(217) 786-6375 or
(800) 252-8533

*Reviewer did not examine document.

Darlow, R. I. Electro-mechanical Electronic Engineering Technology Curriculum Guide. Agana, Guam, 1982.

This curriculum guide is available from:

Western Curriculum Coordination Center
1776 University Avenue, Wist Hall 216
Honolulu, Hawaii 96822
(808) 948-6496

Decker, R. L. Hydraulics Curriculum Guide. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, 1980.

There are fourteen competency-based units of instruction covering hydraulic fundamentals, systems and components, and advanced systems including hydrostatic drives. This is an excellent publication to use in a diesel or automotive program as well as in an in-depth hydraulic program. This publication can also be used in conjunction with MAVCCs Diesel Engine Mechanics book.

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For the current price contact:

Sales Department - MAVCC
1515 West Sixth Avenue
Stillwater, OK 74074
(404) 377-2000

Department of the Army. COBOL Programming Language. Military Curriculum Project. Columbus, Ohio: National Center for Research in Vocational Education, 1978. (ED 198375)

This program of instruction and various instructional materials for a secondary-postsecondary level course for programmer/analysts is one of a number of military-developed curriculum packages selected for adaptation to vocational instruction and curriculum development in a civilian setting. The eight-week, three-section course is designed to provide the skill to program electronic computers structured in COBOL and to code job streams using IBM, DOS, JCL, and utility programs. The program of instruction suggests a time schedule and gives the learning objective and reference(s) for each topic. Section 1, Data Representation, consists of a programmed text covering the binary, octal, and hexadecimal systems. Section 2, Basic COBOL Programming, contains a text and problem exercises with some answers. Topic areas include processing and updating a sequential file, producing an edited report with calculations, processing external and internal tables, debugging syntax errors. Section 3, Operating Systems, includes a text and programmed text. It focuses on disk operating systems (DOS) organization and operation. Specific topics include coding DOS Job Streams, DOS Librarian Programs, and DOS Utilities and Sorts.

Edwards, T. I. and Roberson, C. E., Jr. A Study to Determine the Basic Science and Mathematics Topics Most Needed by Engineering Technology Graduates of Wake Technical Institute in Performing Job Duties. North Carolina: Wake Technical Institute, 1979. (ED 178137)

A survey of 470 graduates of the six engineering technology programs at Wake Technical Institute--Architectural, Chemical, Civil Engineering, Computer, Electronic Engineering, and Industrial Engineering Technologies--and 227 of their employers was conducted in October, 1979, to determine the science and mathematics topics most needed by engineering technicians. The survey instrument, developed by two juror groups and subjected to a stability-reliability test, contained 81 items under 17 topics and an open-ended question. The 17 topical areas were mechanics, fundamentals of electricity/electronics, light, sound, heat, modern physics, chemistry, biology, geology, data processing, algebra, trigonometry, logarithms, geometry, analytical geometry, calculus, and statistics. The survey revealed that: (1) mathematics topics were important to all graduates; (2) various science topics were needed/for different technology areas; (3) knowledge of a computer language was important to all but architectural technicians; and (4) science and mathematics topics were more important to graduates than to employers. A sample questionnaire and over 100 tables are appended.

Electronics/Electrical Curriculum Cluster. Raleigh, NC: North Carolina State Department of Community Colleges, 1977. (ED 134252)

Because of the continuing expansion and acceleration of technology related to the electronics/electrical field, it is necessary to periodically review electronics/electrical curricula to reflect the state of the art. This curriculum guide is the result of such review and revisions. Contained are suggested curricula by quarters, course descriptions, job descriptions, job competencies (performance levels compatible with Dictionary of Occupational Titles job categories and competencies for selected entry/exit points within the curriculum), course outlines with objectives, and instructional equipment lists. It is noted that, in some cases, the texts suggested will need additonal supplementary information. The electronics/electrical curriculua is designed with a common core of courses for the first four quarters, with specialization occurring during subsequent quarters. Areas of specialization include electromechanical technology, electrical technology, instrumentation technology, and electronics technology. The electronics technology curriculum is designed so that a student may specialize in different areas within this curriculum, according to local needs. This manual is available as an aid for institutions wishing to update or to implement an electronics/electrical curriculum.

Electronics Technician Entry-level Occupational Competency Test. S-61ET. Available from:

American Association for Vocational Instructional Materials
The National Institute for Instructional Materials
120 Driftmier Engineering Center
Athens, Georgia 30602.

Fitzpatrick, B. J., et al. Drafting/Design Technology. Postsecondary Curriculum Guide. Athens, Georgia: Georgia State Department of Education, Office of Adult and Vocational Education, 1981. (ED 216116)

This curriculum guide was designed for use in postsecondary drafting/design technology education programs in Georgia. Its purpose is to provide for development of entry-level skills in drafting/design technology in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills, and occupational survival skills. The first section of six explains the philosophies, purposes, and goals of vocational education in Georgia. Section 2 presents employability skills related to the occupational area of drafting/design technology, specific occupational titles, student exit points, and tasks cross referenced to the Dictionary of Occupational Titles. Section 3, the largest part of the guide, provides unit guides for each task. (For each task, a task description, student performance objective, suggested instructional activities, instructional materials, evaluation section, and suggested instruction hours are included.) Section 4 contains the curriculum structures and course outline, while student record forms and competency certificates make up Section 5. The last unit contains facility guidelines, with drawings, for group instruction and individual instruction facilities. Appendices to the guide contain references and resourses, information on teaching special needs students, and definitions of terms.

This is a thorough curriculum which might be used as a guide to assess computer-based drafting programs now being generated.

Flannery, C. A. Technical Mathematics: Restructure of Technical Mathematics. Dallas, Texas: Mountain View College, 1982. (ED 231414)

Designed to accompany a series of videotapes, this textbook provides information, examples, problems, and solutions relating to mathematics and its applications in technical fields. Chapter I deals with basic arithmetic, providing information on fractions, decimals, ratios, proportions, percentages, and order of operations. Chapter II focuses on algebra, covering real number; terms, variables, and expressions; exponents; polynomials; multiplying two expressions; factoring; algebraic fractions; signed numbers; the rectangular coordinate system; first degree, second degree, and linear equations; inequalities; and functions. After chapter III presents the geometric concepts of area, pi, volume, and conic sections, chapter IV provides an introduction to trigonometry, covering positive, negative, general, acute, and quadrantal angles; vectors; right and oblique triangles; graphing of trigonometric functions; calculators with trig functions; period of waves; and trigonometric curves. Next, chapter V focuses on differentiation and integration in calculus. Finally, chapter VI considers the applications of mathematics in plane surveying, computer science, and machine parts inspection, automotive technology, aviation, manufacture engineering processes, pharmacology, and optical technology. Practice sheets with answers are included.

Harris, M. M . Microcomputers in Vocational Education. Topeka, Kansas: Kansas State University, 1983.

This document is a reference source listing sources and summaries as to availability of microcomputers for use in several areas of vocational education. The publication is available for sale from:

Kansas Vocational Curriculum Dissemination Center
Pittsburg State University
Pittsburg, Kansas 66762
(316) 231-7000 ex 417

Jennings, C. A. Basic Programming Language. Little Rock, Arkansas: Arkansas State Department of Education, 1982. (ED 223829)

Designed for use by both secondary- and postsecondary-level business teachers, this curriculum guide consists of 10 units of instructional materials dealing with Beginners All-Purpose Symbol Instruction Code (BASIC) Programming. Topics of the individual lessons are numbering BASIC Programs and using the PRINT, END, and REM statements; system commands; constants, variables, arithmetic operations, and LET statement; methods of input, including READ, DATA, RESTORE, and INPUT statements; program control, including relational operators, GO TO statements, IF THEN statements, logical operators, and counters; program development cycle and flowcharting; formulated output--PRINT USING statement and TAB function; FOR/NEXT statements, built-in functions, and subroutines; and subscripted variables, the dimension statement, and single- and boule-dimensional arrays. Included in each unit are some or all of the following performance objectives, suggested activities for instructors and students, information sheets, visual aids, assignment sheets, answers to assignment sheets, tests, test answers, and references.

Lewis, W. B. and Moth, C. F. Computer Servicing Technology: Occupational Analysis. Denver, Colorado: Occupational Education Division, State Board for Community Colleges and Occupational Education, 1983.

This publication contains an occupational description and duties and tasks performed by entry-level workers. The curriculum is available from:

Curriculum Management Center
Building 17
Airdustrial Park, MSLS-10
Olympia, Washington 98504
(206) 753-1069

Lewis, W. B. and Moth, C. F. Electromechanical-Instrumentation-Maintenance and Computer Servicing Technologies Task Analysis. Fort Collins, Colorado: Colorado State University, 1983.

These publications contain occupational descriptions, duties, and tasks performed by entry-level workers. Available from:

Curriculum Management Center
Building 17
Airdustrial Park, MSLS-10
Olympia, Washington 98504
(206) 753-1069

Lynch, E. J. Robotics Technician Training at Macomb Community College. Michigan, 1983. (ED 228385)

Approved in 1979, the robotics technician training program at Macomb County Community College (MCC) in Warren (Michigan) provides students with training in hydraulics and electronics as well as with hands-on training in the area of robotics. Furthermore, the program includes individuals with work experience in electronics, fluid power, and robotics, as well as a number of adjunct faculty drawn from the local industrial community. Because MCC is an open door institution, the background of studnts enrolled in robotics courses ranges from those without a high school diploma to those with masters' degrees. Included among the skill areas addressed by courses in the robotics curriculum are the following: (1) electronics, pneumatics, hydraulics, and mechanics; (2) robotics; and (3) basic skills (English, math, and physics). Because the college maintains contact with a large number of vendors and users of industrial robots, it has managed to place program graduates in positions in the sales and installation of robots, robot maintenance, customer service, testing, and manufacturing. Program completers at MCC meet the certification standards of a number of organizations, including the Society of Mechanical Engineers/Robotics International, The Robotics Institute of America, and American Fluid Power Association.

Military Curriculum Materials for Vocational and Technical Education. Avionics Instrument Systems Specialist. Columbus, Ohio: National Center for Research in Vocational Education, 1978. (ED 193540)

This high school/postsecondary-level course for avionics instrument systems specialist is one of a number of military-developed curriculum packages selected for adaptation to vocational instruction and curriculum packages in a civilian setting. A plan of instruction outlines five blocks of instruction (281 hours of instruction). Block 1, Aircraft Maintenance Fundamentals, includes programmed tests, handout, and workbook on four topics: Aircraft Familiarization, Avionics Safety, Avionics Maintenance Fundamentals, Pressure Sensors. Block 2, Engine Instruments, contains programmed texts, workbooks, and handouts on nine topics; Position Indicating Systems, Fuel Flow Indicating Systems, Engine Pressure Ration Indicating Systems, Resistence-Type Liquid Quantity System, Capacitance Liquid Quantity System, Vertical Scale Engine Instrument Systems. Block 3, Flight Instruments, contains programmed texts, workbooks, handouts, and worksheets on five topics: Pilot-Static Systems and Instruments, Automatic Altitude Reporting System, Accelerometers, Flight Data Recorders, Air Data Computer Systems and Vertical Scale Flight Instruments). Block 4, Integrated Flight and Navigational Instruments, includes programmed texts, workbooks, and handouts of five topics: Flight Instruments, Direct Reading Altitude Heading Reference and Gyro Stabilized Magnetic Compass Systems, MC-1 Compass Calibration. Block 5, Flight Director Systems, contains a programmed text, handouts and workbook. Note: This document is 2,229 pages in length.

Mixon, E. Industrial Instrument (Electronic) Maintenance Curriculum Guide. Natchitoches, LA: Vocational Curriculum Development and Research Center, 1979.

This manual is one unit of the Industrial Instrument Maintenance Course and is designed to offer entry-level knowledge and skills needed to trouble-shoot and service electronic instruments. Tne instructional content is organized into nine major sections, 42 related study assignments, and 38 job sheets. (Not copyrighted, local reproduction authorized) Sale: $10 (one copy only)

Contact: Vocational Curriculum Development and Research Center
P.O. Box 1159
Natchitoches, LA 71457
(318) 352-5348

Mowery, D. R. and Wolf, L. J. Science and Engineering Technician Curriculum Development Project. Final Report. St. Louis Missouri: Saint Louis Community College, 1979. (ED220265)

Project SET (Science and Engineering for Technicians) developed a series of study guides designed to teach generic science and engineering skills to students interested in becoming technicians. An entire two-year curriculum is encompassed by these guides, geared for two-year college students. Described in this final report are the project's rationale, goals, and activities (curriculum design and trial implementation), study guide production, dissemination activities, and evaluation activities. Appendices include Advisory Committee list, Cooperating Colleges list, SET Study Guide Contents, and Summary Evaluation Findings/Recommendations by Karen C. Cohen. Topics of study guide lists include: algebraic/ trigonometric equations; analog/digital electronics; chemical science/ technology; computer/calculator techniques; calculus; electronic components, transducers, and basic circuits; functions, analytic geometry, and statistics; electronic instrumentation; materials/fabrication methods; writing organization/expression; physics of electromagnetic optical and solid state systems; physics of mechanical gaseous/fluid systems; and science/engineering graphics. Instruments used and complete results of pre- and post-surveys of teachers and students are provided in the summary evaluation appendix. Results indicate that although the study guides were well received there was no indication that they can be used in self-study or stand-alone fashion.

Parsons, H. and Kearsley, G. P. Human Factors and Robotics: Current Status and Future Prospects. Alexandria, Virginia: Human Resources Research Organization, 1981. (ED 206911, also see ED 210510)

The principal human factors engineering issue in robotics is the division of labor between automation (robots) and human beings. This issue reflects a prime human factors engineering consideration in systems design--what equipment should do and what operators and maintainers should do. Understanding of capabilities and limitations of robots and people is necessary to examine how their performances should be interrelated. Robots readily fit into the context of automation of equipment/product design and manufacturing management. Their capabilities fit into four major functional categories--manipulation, locomotion, sensing, and executive. Robots may be used in a variety of settings for a number of industrial operations. Criteria to be considered in deciding whether to use robots are costs, production, parts, quality, reliability, space, safety, environment, and management. Human factors engineering issues in robotics other than the primary one of division of labor are design, procedurization, and protection. Investigations addressing human factors engineering in robotics have thus far focused on teleoperators, an Integrated Computer-Aided Manufacturing Program, and Adaptable-Programmable Assembly Systems. A need exists for more analysis and empirical studies directed at division of labor between humans and robots and their symbiosis.

Parsons, H. "Automation and Engineering Psychology: A Look to the Future." Paper presented at the Annual Meeting of the American Psychological Association, Los Angeles, CA, 1981. (ED 210150, also see ED 206911)

Various aspects of automation are explained to differentiate it from technology and mechanization and to show the difference between using equipment to help humans and using equipment to replace humans. Five reasons are given for engineering psychology to focus its attention on automation. Automation issues in a number of areas are discussed, including command and control systems, robotics, combat aircraft, air traffic control, nuclear power plants, and offices of the future.

Sappe, H., et al. Electronic Technology. Postsecondary Curriculum Guide. Athens, Georgia: Georgia State Department of Adult and Vocational Education, 1981. (ED 216119)

This curriculum guide provides a model for a postsecondary electronic technology program. It is divided into ten sections. Section 1 overviews the philosophy, purpose, and goals for vocational education in Georgia. Contents of Section 2 include a definition of the guide's purpose and program objective. Section 3 describes the occupational field, discusses employability skills, and provides information on exit points and task listing by Dictionary of Occupational Titles code. Examples of a curriculum structure and course outline are provided in Section 4. Section 5 contains the unit guides for 14 courses and 140 units/tasks. Each task contains the following information: task, performance objective, instructional activities, suggested instructional materials, evaluation, and classroom hours. Topics covered include tools, safety, and equipment; measurement and calculation (direct and alternating current); testing subassemblies; equipment maintenance; and designing electronic circuitry. Section 6 includes an instructional resource matrix, list of textbooks, suppliers of materials, and additional instructional resources. Forms for recording student progress are provided in Section 7. Section 8 addresses working with special needs students. Sections 9 and 10 contain facility layouts and definitions of terms.

Sappe, H., et al. Instrumentation Technology. Volume 1. Postsecondary Curriculum Guide. Athens, Georgia: Georgia State Department of Adult and Vocational Education, 1981. (ED 216125)

This curriculum guide was designed for use in postsecondary instrumentation technology education programs in Georgia. Its purpose is to provide for development of entry-level skills in instrumentation technology in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills, and occupational survival skills. The first section explains the philosophies, purposes, and goals of vocational education in Georgia. Section 2 presents employability skills related to the occupational area of instrumentation technology, specific occupational titles, student exit points, and tasks cross referenced to the Dictionary of Occuptational Titles. Section 3, the largest part of the guide, provides unit guides for each task. (For each task, a task description, student performance objective, suggested instructional activities, instructional materials, evaluation section, and suggested instruction hours are included.) Section 4 contains the curriculum structure and course outline, while student record forms and competency certificates make up Section 5. The last unit contains facility guidelines, with drawings, for group instruction and individualized instruction facilities. Appendices to the guide contain referenes and resources, information on teaching special needs students, and definitions of terms.

The Impacts of Robotics on the Workforce and Workplace. Pittsburgh, PA: Carnegie-Mellon University, 1981. (ED 231947)*

This paper surveys the impact of current and expected future robotics technology on the workplace and workers. The monograph is organized into seven chapters. The first chapter introduces the issues of robotics and of social displacement as result of anticipated growth in the use of industrial robots. In the second chapter, results of a study conducted by the students are reported. The study asked executives of major industries how they were using robots currently and how they planned to increase their use in the future. Technological changes in coal mining and newspaper printing are profiled in the third chapter. In Chapter 4, technological changes caused by the introduction of rototics into industry in general are discussed. The fifth chapter examines the capabilities of robots for performing various types of manufacturing jobs; tasks are analyzed in industries such as metalworking, and estimates are made of the number and types of jobs that robots could do. The last two chapters of the monograph discuss short-term transitional issues and human resource policies in the change to a robotic society. Issues such as the role of unions and retraining for displaced workers are included in the discussion. Appendices to the document include survey documents, the effects of age distribution on unions, and supplementary human resource material.

*This is not a curriculum guide but contains information the instructor might use in explaining the dynamics of robotics to the students.

Tree, Merle. Computerized Numerical Control Program. Tupelo, Mississippi: Itawamba Junior College, Industrial Services Division.

This curriculum consists of a teaching guide and learning modules based upon competency objectives. The modules include introduction to computerized numerical control operations and programming plotter, lathe, and milling machine. The curriculum is on loan from:

Librarian, Southwest Curriculum Coordination Network
P.O. Drawer DX
Mississippi State, Mississippi 39762
(601)325-2510

United States Air Force, School of Applied Aerospace Sciences. Communications Computer Programmer. Columbus, Ohio: National Center for Research in Vocational Education, 1978. (ED 183895)

This is a teaching guide including learning modules and reference material. Areas covered include computer mathematics, data representation, computer logic functions, FORTRAN, logical development of problem solutions, programming principles, program design language, and structured code.

V-TECS. Computer Programmer. Atlanta, Georgia: Vocational-Technical Education Consortium of States, Southern Association of Colleges and Schools, 1976.

A V-TECS catalog contains a complete worker validated task list and tools, equipment, and work aids list for the job title(s) specified. Each task is further expressed in the form of performance objectives which contain the conditions and worker identified standard for each task. Performance steps are also listed as a guide to conduct of the task.

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Atlanta, GA 30365
(404) 897-6158

Wasserman, W. J. Development of a Curriculum in Laser Technology. Final Report. Seattle, Washington: Seattle Community College, 1980. (ED 190860)

The Seattle Central Community College project visited existing programs, surveyed need, and developed a curriculum for a future program in Laser-Electro-Optics (LEO) Technology. To establish contacts and view successful programs, project staff made visits to LEO technology programs at San Jose City College and Texas State Technical Institute, Center for Occupational Research and Development facilities (Waco, Texas), the Junior-Senior Graduate program in Electro-Optics at the University of Houston (Clear Lake City), and leading United States employers of laser technicians. A survey indicated that current prospects for LEO technician employment in Washington did not justify present establishment of an advisory committee or functioning program. A curriculum was developed as the basis of a future LEO technology program if continuing study indicates feasibility. The six-quarter program included special time and location requirements and utilized existing courses. (Proposed course content is briefly described.) (Appendices, amounting to over one-half of the report, include a list of current two-year LEO technology programs, the San Jose City College Laser Technology curriculum, Texas State Technical Institute--Waco LEO Technology Curriculum, University of Houston-Clear Lake City curriculum, and the survey forms.)